

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **09-184030**
(43)Date of publication of application : **15.07.1997**

(51)Int.Cl. C22C 1/05
C04B 35/583
C22C 29/12
C22C 29/16

(21) Application number : 07-352807

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(22) Date of filing : 27.12.1995

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(54) PRODUCTION OF HIGH STRENGTH HARD COMPOSITE MATERIAL EXCELLENT IN THERMAL SHOCK RESISTANCE

(57)Abstract:

PROBLEM TO BE SOLVED: To produce a high strength hard composite material excellent in thermal shock resistance by sintering a powder mixture of specific composition under respectively prescribed temp. and pressure.

SOLUTION: The raw material is prepared by mixing the powders of the following compounds: cubic boron nitride(cBN), aluminum oxide, one or more metal compounds selected from the carbides, nitrides, and borides of metallic aluminum, silicon, and the group IVa, Va, VIa elements of the periodic table or solid solution thereof, etc. These powders are regulated to required blending quantities, and the resultant powder mixture is pressure-sintered at a pressure of $\geq 100 \text{ MPa}$ at $1100\text{--}1500^\circ\text{C}$. The resultant material is a dense sintered compact in which cBN grains exist discontinuously as dispersed phases in a matrix composed essentially of the hard inorganic substances except cBN and which is free from hexagonal boron nitride of low-pressure stabilized type.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]